



OWNER'S INSTRUCTION MANUAL

SONY
VIDEOREORDER
CV-2200A

PLAY

STOP

REWIND

RECORD

FAST FWD

SONY-MATIC VIDEOREORDER SOLID STATE || DUPLICATOR

Introduction

PLEASE READ THIS MANUAL COMPLETELY BEFORE OPERATING YOUR SONY VIDEOCORDER.

This Operating Manual has been carefully prepared to help you to learn how to make high-quality video recordings and to keep your Videocorder at top operating efficiency. Careful attention to these instructions will ensure peak performance and long operating life.

Your new SONY CV-2200A records pictures (video signals) and sound (audio signals). Recording operations are fully automatic, and recordings can be played back immediately. When used with a separate SONY Monitor/Receiver, the Videocorder can tape selected (non-copyrighted) programs for viewing at a more convenient time. By adding the Video Camera and Microphone, you can tape the sight and sound of your own live performances. Instantaneous playback greatly enhances the enjoyment of this type of "home-movie" entertainment.

Features

Automatic Recording Level Controls (AGC system)

The Audio AGC (automatic gain control) system has been employed in SONY audio tape recorders for some time. This system automatically regulates the audio amplifiers to maintain a nearly constant recording level despite variations in microphone input levels.

Your CV-2200A now adds automatic control of video level. This means that the videocorder automatically adjusts itself to changing levels of video signal from either the TV Monitor or the Video Camera.

These automatic features yield perfect recordings with very little effort. There is no need to watch level meters, as the automatic circuits keep track of video and audio levels for you. The AGC systems can be disabled to provide manual control if you desire.

Simple, Stable Operation

Operation is similar to that of conventional audio tape recorders. Recording and playback functions are controlled by a single knob. Precisely designed circuits, super-sensitive rotating heads, and a servo-controlled drive mechanism assure steady clean pictures and sound. You can scarcely tell the playback picture from the original telecast.

Convenient Facilities—Editing and Duplicating

Editing facility.....While the playback operation is in progress, new material from the Video Camera can be added by pressing the EDITING button at the appropriate spot on the recording. This provides a smooth "joint" between old and new material without the need for splicing tape. In addition sound can be added to prerecorded pictures during the playback operation. This makes it possible to add running commentary or background music to visual action that you have recorded at an earlier time.

Duplicating facility.....With the use of the two Videocorders CV-2200A and the SONY Duplicator for Videocorder model VDC-1, you can duplicate a prerecorded tape; the picture and sound of the prerecorded tape are transposed automatically onto another tape with the same recording level of the original prerecorded tape. Complete tape interchangeability makes it possible to distribute the same taped material to any place where a SONY Videocorder is available.

Complete Tape Interchangeability

Any tape recorded on the SONY Series CV-2000* Videocorder can be played back on any other CV-2000 Series Videocorder.

*All units with model numbers in the 2000 series.

Improved SONY Video Tape permits one-hour recordings. The tape may be played many times, or the tape may be erased and used to make new recordings over and over again.

Compact and Lightweight

The easy-to-carry Videocorder operates anywhere that 115—120 volt house current is available. Little larger than an audio tape recorder, the Videocorder can take the action that you want to record.

High-quality SONY transistors ensure long trouble-free performance with very little power consumption.

Simple Connections

A single plug-in type cable completes all connections between the camera and the Videocorder. Single-cable connections also complete connections between the Videocorder and the Monitors in most cases.

Optional Equipment

All optional SONY accessories, such as the Video Camera, large screen monitors and other items are especially designed to work with your videocorder.

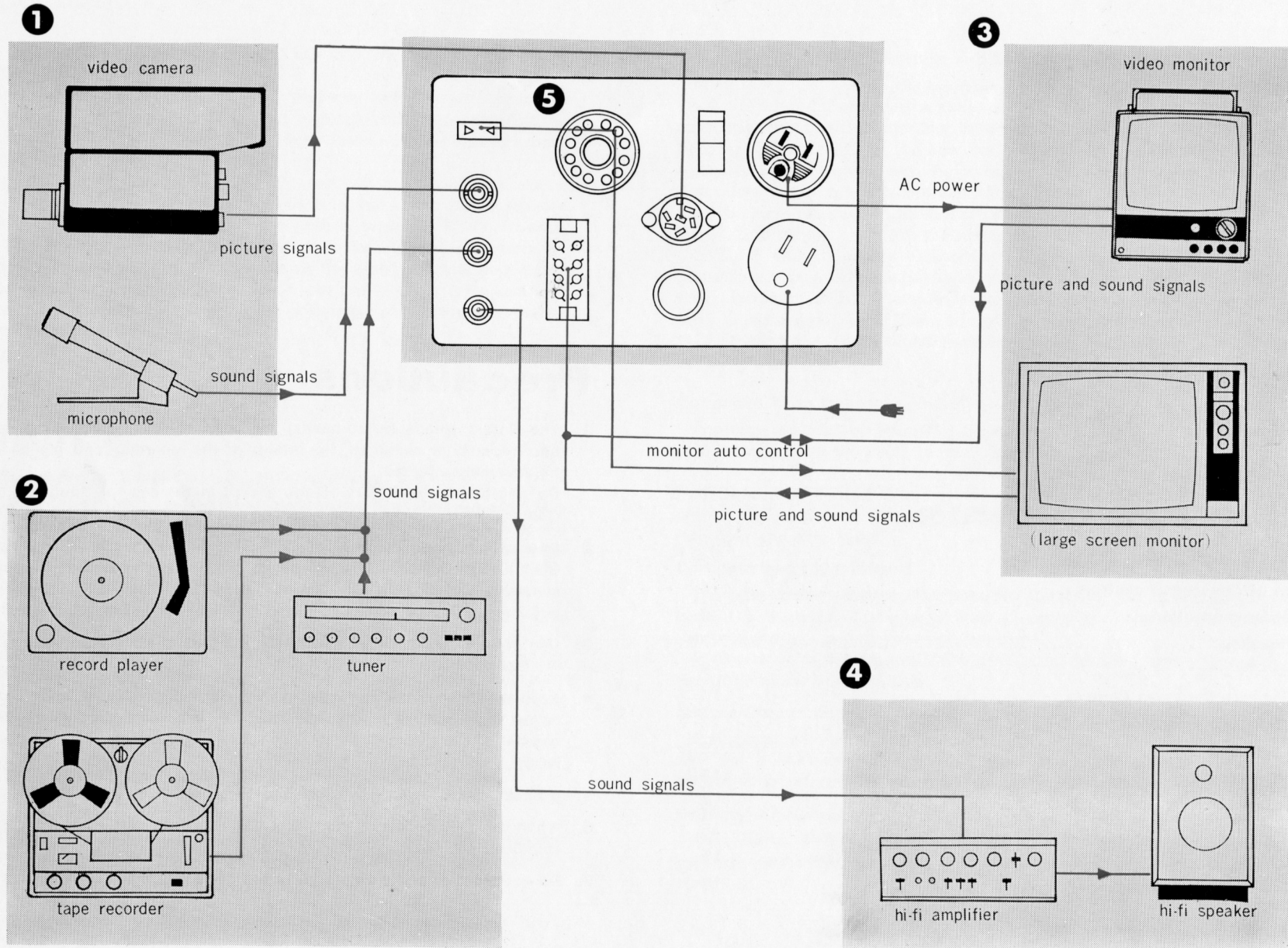
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Precautions

1. The Rotary Heads (video heads) are precisely engineered. If the heads become dirty or damaged, the quality of the recording and playback may be adversely affected.
Do not touch the Rotary Heads except in the case of threading tape or cleaning heads. Never touch the heads while the motor is running.
2. In usual operation the MOTOR SWITCH should be set in ON position, the DUPLICATE CONNECTOR should be plugged in with the dummy plug supplied, and the VIDEO LEVEL CONTROL/STANDBY KNOB should be pushed.
3. Use your Videocorder in horizontal position only. Never use the set in vertical position.
4. Keep the Videocorder or the tapes away from dusty places, extremely high or low temperatures, excessive moisture, and strong magnetic fields or sources of electronic noise such as motors, generators, and voltage regulators.
5. Do not block the ventilation grille at the bottom.
6. When the Videocorder is transported, remove the tape reels from the reel spindles.
7. Do not press or apply any force to the head drum.

Components of Video-Recording System

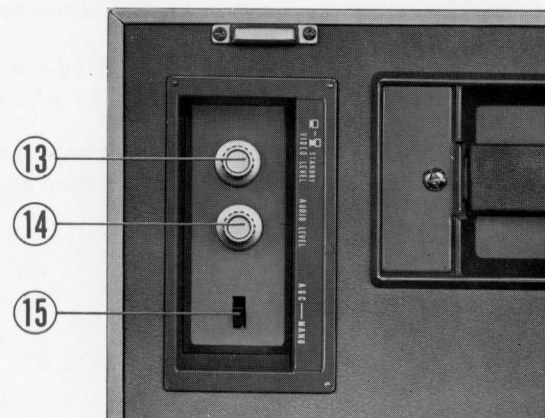
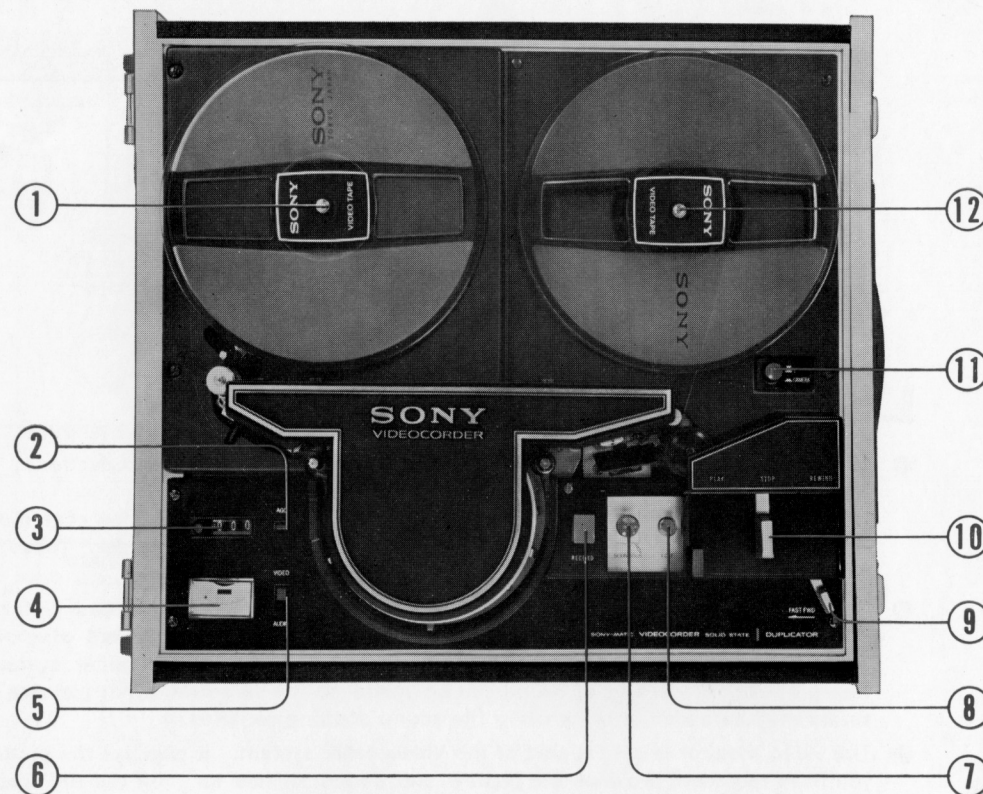


Legend

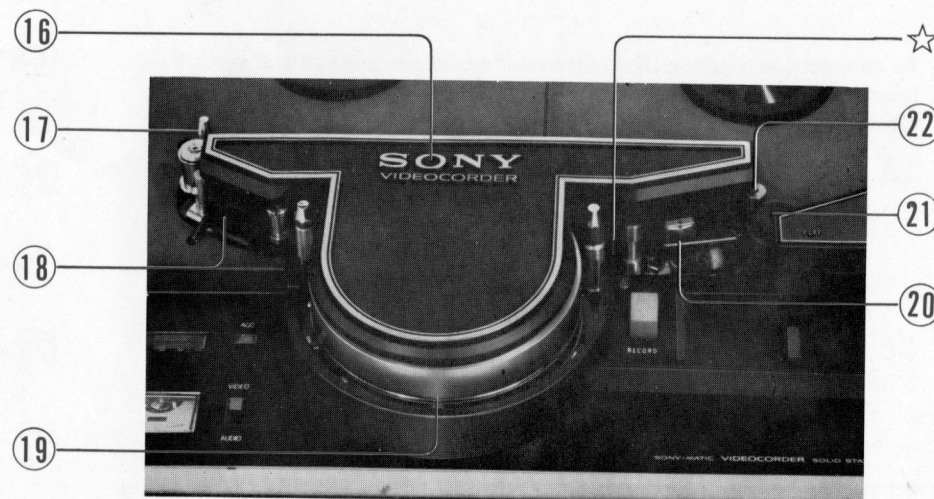
- ① The optional video camera kit allows you to record your own TV productions. The camera is easy to use and adapts itself automatically to varying light conditions.
The microphone adds the realism of sound that is lacking in most low-cost movie productions. To help make your tape library, use the editing facilities on the Videocorder. These facilities permit easy and economical editing of your tapes without splicing.
- ② Occasionally, you may want the sound that accompanies the recorded picture to be background music, prerecorded commentary, or other sound effects. Record players equipped with a crystal cartridge, tuners, audio tape recorders, or your existing microphone/amplifier system, may be used for this purpose. Recording of sound can be made at the same time that pictures are recorded, or the sound may be added later by using the sound dubbing facilities.
- ③ The video monitor is a vital part of the Videocorder system. It displays the pictures and sounds that you have recorded, provides the picture and sound signals for "off-the-air" recording, and permits you to monitor camera and microphone output when these components are in use. All SONY Monitors in the CVM series connect to the 8-pin connector at the rear of the Videocorder. Some of the large-screen monitors require an additional cable connection for automatic control of the monitor by the Videocorder.
- ④ Normally, sound produced by the system is provided by the audio amplifiers and speakers of the Monitor. However, if you prefer, you can feed the sound output of the Videocorder through your existing high-fidelity system.
- ⑤ You can copy your master tapes using another CV-2200A and the SONY Duplicator for Videocorder Model VDC-1. Copies have the resolution and high picture quality of the original.

Location of Videocorder Controls

- ① **SUPPLY REEL SPINDLE**
Place a full reel on this spindle.
- ② **AGC LIGHT**
The Videocorder adjusts audio and video recording level automatically when this light is on.
- ③ **TAPE COUNTER & RESET BUTTON**
Indicates the amount of tape used in either record or playback. Before recording, press the RESET BUTTON to set the counter to [000].
- ④ **LEVEL METER**
Indicates either audio or video recording level (depending upon the setting of the LEVEL METER SELECTOR) during manual recording or playback. The meter does not function while the Videocorder is in the automatic recording mode.
- ⑤ **LEVEL METER SELECTOR**
VIDEO position.....To check the video recording level in the manual mode of operation. While recording, adjust the VIDEO LEVEL CONTROL/STANDBY KNOB so that the needle of the LEVEL METER falls within the blue zone of the LEVEL METER.
AUDIO position.....To check the audio recording level during manual recording. Adjust the AUDIO LEVEL CONTROL KNOB so that the needle of the LEVEL METER does not go beyond the blue zone during sound peaks.
- ⑥ **RECORD BUTTON**
To place the Videocorder in the recording mode, press the button down. The light in the LEVEL METER will light showing that the Videocorder is in the recording mode. The button should be held down when setting the FUNCTION SELECTOR to the PLAY position to start recording.
- ⑦ **SOUND DUBBING BUTTON**
Press to add sound (audio signals) to prerecorded pictures during playback.
- ⑧ **EDITING BUTTON**
To edit the tape. This button permits easy switchover from playback to a new recording using the video camera. It also permits sound dubbing during playback.



- ⑨ **FAST FORWARD LEVER**
To advance the tape quickly; keep the **FUNCTION SELECTOR** in the **PLAY** position and slide the lever to the left until a slight click is heard.
- ⑩ **FUNCTION SELECTOR**
PLAY position.....To record and playback.
STOP position.....To stop tape motion.
REWIND position.....To rewind the tape.
- ⑪ **TV/CAMERA SWITCH**
TV position.....To record on-the-air TV programs.
CAMERA position.....To record pictures supplied by the video camera.
- ⑫ **TAKE-UP REEL SPINDLE**
Place an empty reel on this spindle.
- ⑬ **VIDEO LEVEL CONTROL/STANDBY KNOB**
VIDEO LEVEL CONTROL.....To adjust the video recording level manually, turn this knob while watching the **LEVEL METER**. Set for a blue-zone reading.
STANDBY.....For cleaning the slip rings. See page 16.
Normally, this knob should be pushed in as far as it will go.
- ⑭ **AUDIO LEVEL CONTROL KNOB**
Controls audio recording level manually when **AGC/MANUAL SWITCH** is in the **MANUAL** position. Turn this knob while watching the **LEVEL METER**. The needle should not swing beyond the blue zone during sound peaks.
- ⑮ **AGC/MANUAL SWITCH**
Selects manual or automatic control of audio and video recording levels.
AGC position (Automatic Gain Control).....Audio and video recording levels are adjusted automatically.
MANUAL position.....AGC is disabled. Audio and video recording levels are adjusted manually by turning the **AUDIO** and **VIDEO** **LEVEL CONTROL KNOBS**.
- ⑯ **HEAD COVER**
Protects the rotary video heads.



- ⑰ **TENSION ARM**
Regulates tape tension to provide an intimate contact between tape and heads.
- ⑱ **ERASE HEAD**
During recording previous recordings are erased as the tape passes over this head.
- ⑲ **ROTARY VIDEO HEADS**
Record or playback video signals.
- ⑳ **CONTROL/AUDIO HEAD**
Record and playback servo control and audio signals.
- ㉑ ㉒ **PINCH ROLLER & CAPSTAN**
Applies driving motion to the tape.
- ☆ **AUTOMATIC SHUT-OFF SWITCH**
Power will be shut-off automatically if the tape breaks or runs out.
NOTE: If the **FUNCTION SELECTOR** is set to the **PLAY** or **REWIND** position without threading tape, the power will be shut-off automatically by this switch.

Videocorder Connections

All connections between the Videocorder and other units of the system (monitors, cameras, microphones, etc.) are made at the jack plate located at the rear of the instrument.

②③ DUPLICATE CONNECTOR

Usually this connector should be plugged in with the 12-pin dummy plug (supplied). When duplicating tapes, pull out the dummy plug and connect the SONY Duplicator for Videocorder VDC-1. For details on duplicate, see page 13.

②④ AUXILIARY CONTACT JACK

Provides relay connections for the large-screen monitor SONY CVM-180 U, 220 U or conventional TV set, whereby the monitor switches automatically from normal TV to monitor operation when the FUNCTION SELECTOR is set to the PLAY position.

②⑤ MICROPHONE INPUT JACK*

To connect SONY microphone (included with the optional Video Camera Kit VCK-2100A), or any high-quality low-impedance dynamic microphone.

②⑥ AUXILIARY INPUT JACK*

To connect an alternative source of sound, such as a phonograph, tuner, tape recorder or another microphone/amplifier system.

②⑦ LINE OUTPUT JACK*

To permit audio connections to an external Hi-Fi system or a high impedance crystal earphone. (Do not use the low-impedance earphones that are furnished with some optional video monitors.)

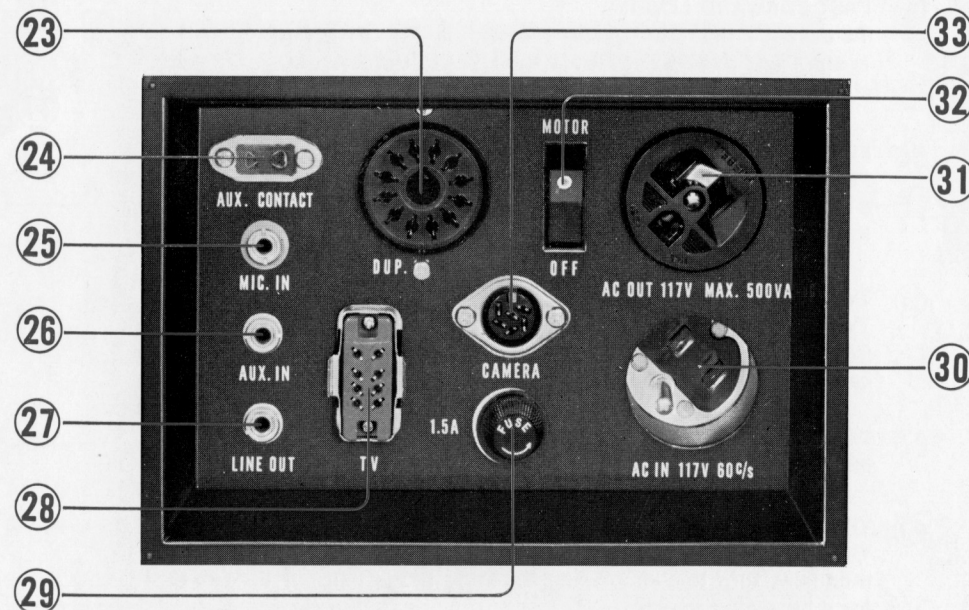
* Jacks accept a standard 5/8-inch "mini" plug. See specifications for voltage levels and impedance, on page 18.

②⑧ TV CONNECTOR

To connect SONY Monitors. Video and sound interconnections to peripheral equipment are made at this jack. See specifications on page 19 for details. This connector is also used for duplicating.

②⑨ FUSE HOLDER

Accepts a 1.5 ampere cartridge fuse. Do not use a fuse with a higher rating



③④ AC INPUT

To make connections with a 115-120V 60Hz* AC power outlet using the AC power cord supplied with the Videocorder.

*Hz=cycle per second

③① AC OUTLET

Provide AC power to Videocorder components (monitor, video camera, etc). Maximum rating of the outlet is 500 watts (VA).

③② MOTOR SWITCH

This switch activates the motor of the mechanism. Usually the switch should be placed to ON position.

When you desire only to monitor camera shooting, set the switch to OFF position. The rotary heads will stop and you can monitor the picture without running tape.

③③ CAMERA CONNECTOR

To connect the SONY Camera CVC-2100A.

Tape Threading

1. Be sure to use the same size tape reels for supplying and taking up the tapes. Place a full reel of tape on the SUPPLY REEL SPINDLE (left) and an empty reel on the TAKE-UP REEL SPINDLE (right). The shiny surface of tape should face toward you.
2. Unwind approximately two feet from the full reel and thread it from left to right as illustrated.
3. Wrap the tape around the hub of the TAKE-UP REEL (right) with one or more turns and remove the slack of the tape by turning the TAKE-UP REEL.

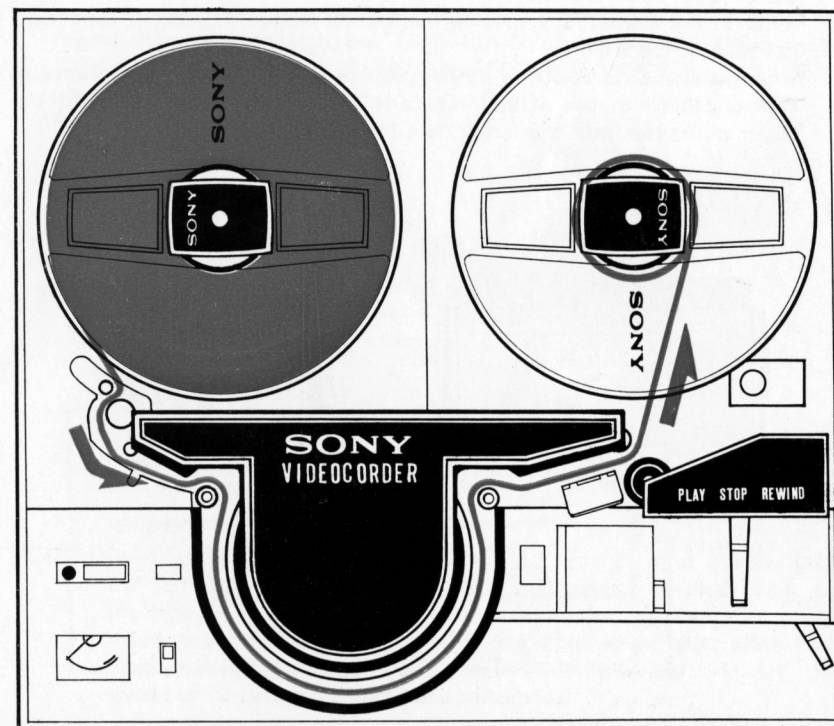
NOTE: Before threading the tape, be sure the VIDEO LEVEL CONTROL/STANDBY KNOB is pressed to OFF. Never attempt to thread the tape with the head drum running, otherwise you may damage the ROTARY VIDEO HEADS.

The ROTARY VIDEO HEADS are very sensitive. When threading or removing the tape, avoid any mechanical shock to these heads.

Never attach an adhesive or sticky tape on the end of the tape as it will cause stretching of the tape at the end of the rewinding operation.

The full width of tape is used for recording pictures and sound. This tape cannot be reversed.

With the use of the Dust Cover CVO-3 (optional accessory), you can keep the Videocorder covered while it is operated.

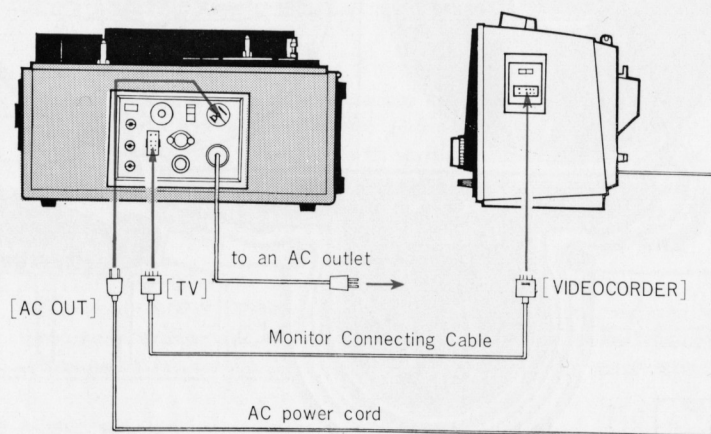


Recording TV Programs

A SONY Model CVM-51UWP, 51WP or one of the large-screen monitors in the CVM series is required for this operation. Connecting cables are supplied with the Monitors.

Connections

1. Push the 8-pin connector of the Monitor Cable into the mating 8-pin receptacle on the jack plate at the rear of the Videocorder.
Note that six of the pins on the cable connector are grouped together, but two are set apart somewhat. These two pins should be uppermost as the connector is pushed into the mating receptacle. Push the connector in firmly until it 'clicks' into place.
To unplug the connector, squeeze the plastic release bars on each side of the connector, and pull straight out.
2. Plug the power cord of the Monitor into the AC OUTLET of the Videocorder. The Monitor's power cord may also be plugged into an ordinary wall outlet (115-120V, 60Hz), if convenient.
Refer to the Monitor's Operating Instruction Manual for proper cable connections at the Monitor.
3. When you use CVM-180U, or 220U plug the two-pin connector of the relay control cable into the AUXILIARY CONTACT JACK. Make sure that the larger pin mates with the larger hole in the jack.



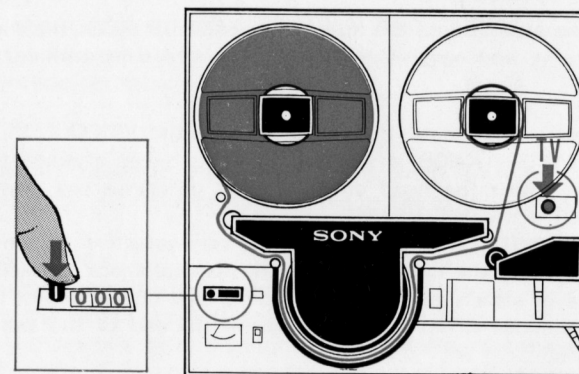
Important

Keep the dummy plug (supplied) in the DUPLICATE CONNECTOR when the CV-2200A is used for usual recording and playback operations. If the dummy plug is not in place, proper recordings cannot be made and playback pictures will be unstable and noisy.

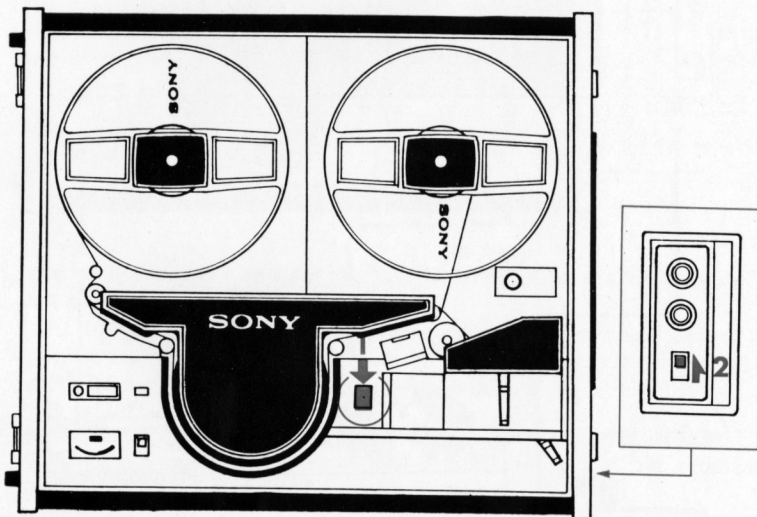
Usually keep the MOTOR SWITCH in the ON position. This switch turns on or off the motor of the mechanism. When the switch is placed in the OFF position, the tape transport mechanism and the rotary head assembly will not move even when you turn on the Videocorder.

Recording procedure

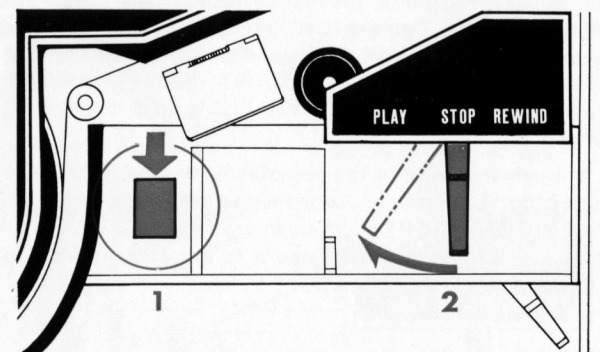
1. Set the TV/VTR SWITCH of the monitor to the TV position.
Turn on the monitor and adjust its controls so that the monitor produces the best picture on the channel whose program is to be recorded. It is important to obtain the best possible picture at this point.
Remember that the recorded picture can be no better than that which the monitor supplies.
2. Set back the TV/VTR SWITCH of the monitor to the VTR position.
3. Thread a video tape as explained on page 7, and set the TAPE COUNTER to [000] by pushing the RESET BUTTON.
4. Set the TV/CAMERA SWITCH of the Videocorder to the TV position.



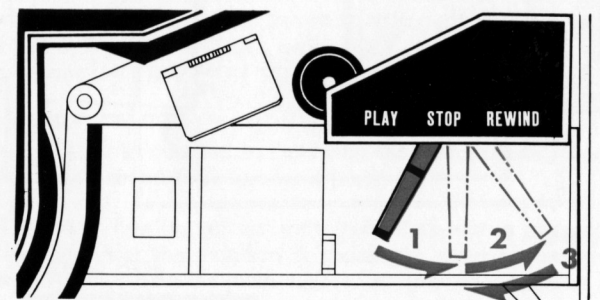
5. Depress the RECORD BUTTON of the Videocorder until it locks into position. The rotary head assembly will start to rotate. The red light in the LEVEL METER will light to tell you that the Videocorder is ready for recording.
6. Set the AGC/MANUAL SWITCH to AGC position.
No adjustment of Video and audio signal levels is required when the Videocorder is in AGC (Automatic Gain Control) record mode. (LEVEL METER needle does not move.)
If manual level control is desired, set AGC/MANUAL SWITCH to MANUAL position and proceed as follows.
Video recording level set the LEVEL METER SELECTOR to the VIDEO position and turn the VIDEO LEVEL CONTROL/STANDBY KNOB so that the needle of the LEVEL METER registers in the blue zone on the scale.
It is recommended to adjust the video recording level by receiving a picture of which black and white color ratio is almost the same.
Audio recording level set the LEVEL METER SELECTOR to the AUDIO position; turn the AUDIO LEVEL CONTROL so that the needle of the LEVEL METER does not swing past the blue zone during loud passages.
Video and audio level adjustments are now accomplished.



7. To start recording, hold the RECORD BUTTON down as you move the FUNCTION SELECTOR to the PLAY position. The tape will start to move and the recording of the TV program will begin.



8. When you finish recording, set the FUNCTION SELECTOR to the STOP position. Set the FUNCTION SELECTOR to the REWIND position to rewind the tape. Watch the TAPE COUNTER; when the three zeros [000] appear, move the FUNCTION SELECTOR LEVER to the STOP position.
For playback, refer to page 12.



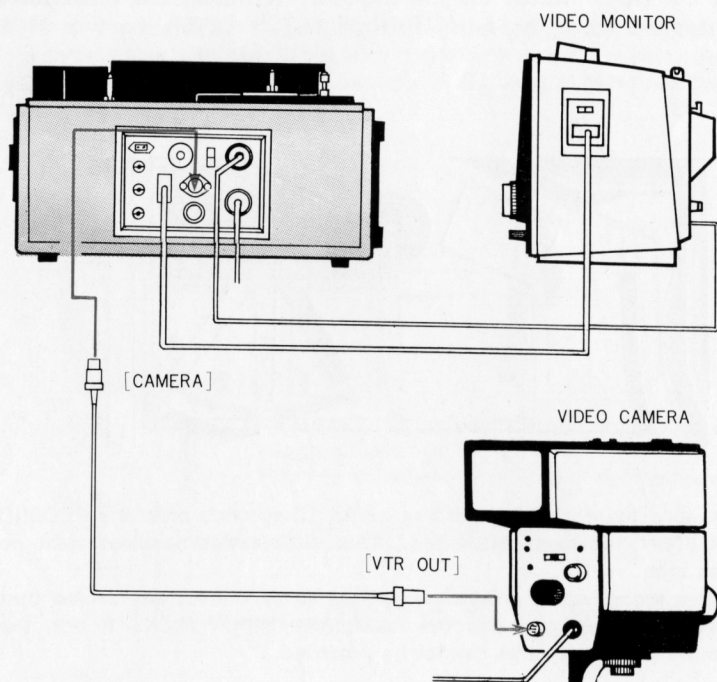
- NOTE: Be sure to start the recording about 15 seconds after the RECORD BUTTON has been depressed. This will prevent needless wear on the tape.
- When recording TV programs, be sure to disconnect any cables that have been plugged into the AUXILIARY INPUT JACK. If not, the sound of TV programs cannot be recorded.

Recording with the Video Camera

The connections and recording procedure instructions given here are for operating with the Video Camera CVC-2100A and the Viewfinder CVF-4. Refer to the operation instruction supplied with the Camera for set-up procedure.

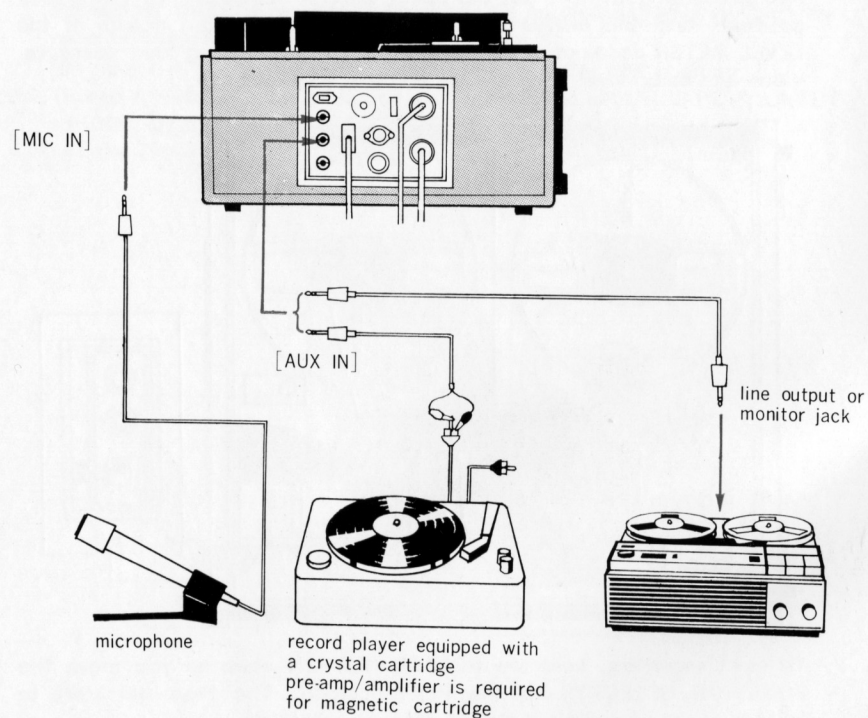
Connections

1. Connect the camera cable to the receptacle marked CAMERA on the rear jack plate of the Videocorder. Connect the other end of the cable to the receptacle marked VTR OUT on the camera. Connect the power cord of the camera to an ordinary wall outlet (115-120V, 60 Hz).



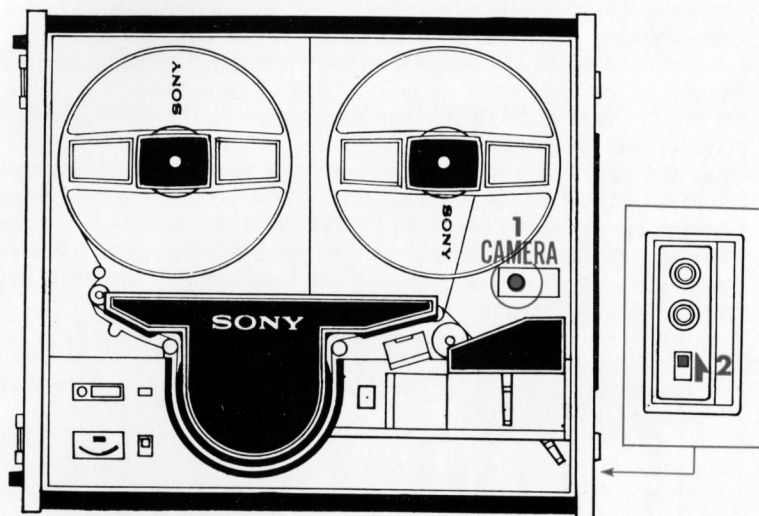
2. To use a microphone, connect a low-impedance microphone to the MICROPHONE INPUT JACK of the Videocorder. Use the SONY Microphone supplied with the Video Camera Kit. To record sound from a tape recorder, phonograph, radio, etc., connect a shielded cord between the sound source and the AUXILIARY INPUT JACK on the Videocorder.
3. Connect the Monitor to the Videocorder (refer to connections on "Recording TV Programs" page 8).

Note: When recording at either the MICROPHONE INPUT JACK or the AUXILIARY INPUT JACK, be sure to disconnect the one which is not in use, or the two sound inputs may be mixed.



Recording Procedure (with camera and microphone)

1. Turn on the camera and set the VTR/VIDEO/RF SWITCH of the camera to the VTR position.
2. Thread a tape as explained on page 7 and set the TAPE COUNTER to [000].
3. Set the TV/CAMERA SWITCH of the Videocorder to the CAMERA position.
4. Set the AGC/MANUAL SWITCH of the Videocorder to the AGC position.

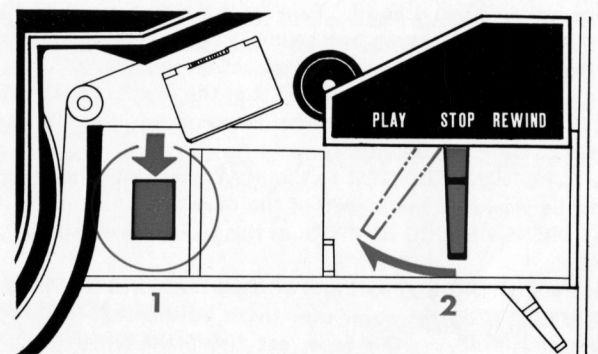


5. Turn on the monitor and set the TV/VTR SWITCH of the monitor to the VTR position.
 6. Point the camera and the microphone toward the subject, adjust lens opening and focusing at the camera by watching the Viewfinder. Refer to the Camera's Instruction Manual for details.
- ☆ If manual recording level control is desired, depress the RECORD BUTTON of the Videocorder until it locks into position and adjust the audio/video recording level as explained on page 9, step 6.

The Videocorder and the camera are now ready for recording.

7. To start recording, hold the RECORD BUTTON down as you move the FUNCTION SELECTOR to the PLAY position*. The tape will start to move and the recording will begin.

* Set the FUNCTION SELECTOR to the PLAY position approximately 15 seconds after the RECORD BUTTON has been pressed.



8. When you finish recording, set the FUNCTION SELECTOR to the STOP position and then turn it to the REWIND position. Watch the TAPE COUNTER; when the three zeros [000] appear in the window, set the FUNCTION SELECTOR to the STOP position.

To playback, set the FUNCTION SELECTOR LEVER to the PLAY position. Adjust picture and sound by following the instructions given at 'Playing Back a Prerecorded Tape' on next page.

NOTE: If acoustic howling occurs while recording with a microphone, reduce the volume at the monitor, or move the microphone away from the monitor. Volume may be turned all the way down at the monitor without changing the sound recording level.

Recording of sound after pictures have been recorded is possible with this Videocorder by using the EDITING BUTTON and SOUND DUBBING BUTTON. Refer to 'Editing Tape' on page 12.

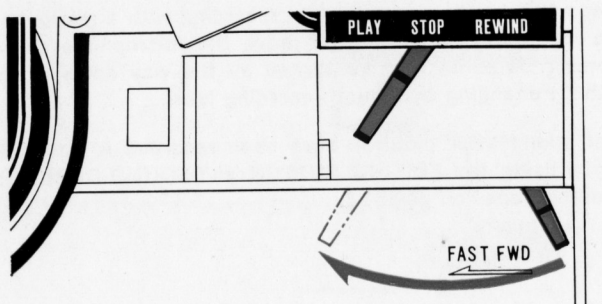
Playing Back a Prerecorded Tape

1. The Monitor must be connected to the Videocorder as outlined in 'Recording TV Programs' on page 8.
2. Turn the Monitor ON.
3. To minimize manipulation of the monitor's controls once playback has begun, it helps to have the monitor preset and ready beforehand. If the monitor has been in use recently, no adjustments will be needed. However, if the monitor has not been used for some time, check its operation using an on-the-air signal as follows. Turn on the monitor, adjust the monitor's controls for normal pictures and sound using any local channel. Refer to details described in the monitor's instruction manual. After adjusting set the TV/VTR SWITCH of the monitor to the VTR position.
4. Thread the prerecorded tape on the Videocorder. See 'Tape Threading' on page 7.
5. Set the FUNCTION SELECTOR to the PLAY position. The recorded picture may now be viewed on the screen of the monitor.
DO NOT PRESS RECORD BUTTON, as this will cause erasure of prerecorded material.
Conceal the EDITING BUTTON and SOUND DUBBING BUTTON when these are not in use; slide the cover over these buttons.
6. When you finish playing the tape, set the FUNCTION SELECTOR to the STOP position.

FAST FORWARD (to skip over to a desired position on the tape)

Keep the FUNCTION SELECTOR in the PLAY position.

Slide the FAST FORWARD LEVER to the left until a slight click is heard. Release the lever and it will automatically return to its original position. The tape will now move forward at a high speed. Stop the tape at the desired position by returning the FUNCTION SELECTOR to the STOP position. Then move the FUNCTION SELECTOR to the PLAY position and the tape will move again at normal speed.



Editing Tape

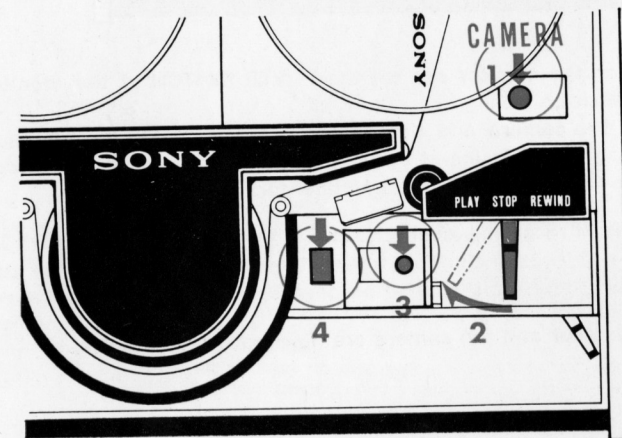
Tape editing can be done by using the editing facilities of the Videocorder or by splicing the tape.

The editing facilities are actuated by the EDITING BUTTON and the SOUND DUBBING BUTTON. These buttons are concealed by a sliding cover when not in use.

How to add a new camera recording

1. Complete the connections between the video camera, monitor and the Videocorder.
2. Turn on the camera and adjust it as explained on "Recording Procedure" on page 11.
3. Set the TV/CAMERA SWITCH of the Videocorder to the CAMERA position.
4. Playback the prerecorded tape.
5. When the part where new pictures are to be added is reached, press the EDITING BUTTON. Then press the RECORD BUTTON. The new recording from the camera starts when the RECORD BUTTON is locked into place.
6. When you finish editing, press the EDITING BUTTON again 1-2 seconds before the end of the new recording and then set the FUNCTION SELECTOR to the STOP position.

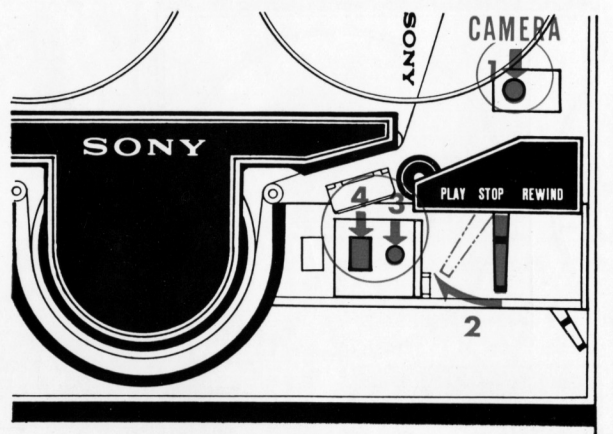
NOTE: When playing back the edited tape, it is normal that stripes may appear on the screen for about 1 second at the beginning (and at the end) of the insertion.



Duplicating Tape

How to add new sound (sound dub)

1. Connect a sound source (microphone, tape recorder, phonograph or radio, etc.) to the proper input of the Videocorder.
For this connection, refer to "Videocorder Connections" on page 6.
2. Set the TV/CAMERA SWITCH to the CAMERA position.
3. Playback the prerecorded tape.
4. When the desired position for dubbing sound is reached, press the EDITING BUTTON. Then press the SOUND DUBBING BUTTON firmly.
Sound dubbing starts when the SOUND DUBBING BUTTON is locked into place (the EDITING BUTTON will come up when the SOUND DUBBING BUTTON locks into place).
5. When you finish sound dubbing, set the FUNCTION SELECTOR to the STOP position.



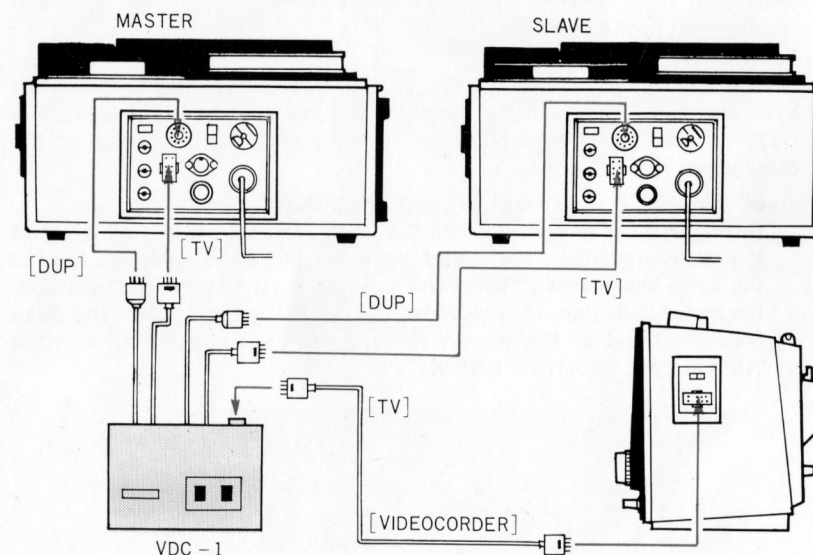
Mixing sound

When the MICROPHONE INPUT JACK and AUXILIARY INPUT JACK are connected to the respective sound sources, these input sounds will be recorded together. This feature permits simple mixing. For example, voice commentary (using the microphone) may be mixed with background music fed in at the AUXILIARY INPUT JACK.

To duplicate a prerecorded tape, use the SONY Duplicator for Videocorder VDC-1 and two model CV-2200A Videocorders.

Connections

1. Pull out the dummy plugs on the DUPLICATE CONNECTORS of both Videocorders.
2. Connect the MASTER cables of the Duplicator to one Videocorder by inserting the round plug (12-pin) to the DUPLICATE CONNECTOR and the rectangular plug (8-pin) to the MONITOR CABLE CONNECTOR of the Videocorder.
3. Connect the SLAVE cables to another Videocorder in the same manner as the MASTER connection.
4. Connect a video monitor (SONY CVM-51UWP or 51WP) to the MONITOR CABLE CONNECTOR of the Duplicator.



Tape Erasing

To duplicate

The MASTER Videocorder plays back an original tape and the SLAVE Videocorder records the played-back pictures and sound which are supplied from the master Videocorder.

1. Thread the original tape on the master Videocorder.
2. Set the slave Videocorder as follows:
 - 1) Thread a recording tape.
 - 2) Set the TV/CAMERA SWITCH to the TV position.
 - 3) Set the AGC/MANUAL SWITCH to the AGC position, so that the recording level of the new copy will be adjusted automatically. However, if you desire to adjust the audio recording level manually, set the AGC/MANUAL SWITCH to the MANUAL position and turn the AUDIO LEVEL CONTROL KNOB while watching the LEVEL METER (for the adjustment, refer to step 6 on page 9).

The video recording level cannot be controlled manually while duplicating.

3. Start both Videocorders by setting the 'master' in the playback mode and the 'slave' in the record mode.
4. To monitor:

Turn on the monitor and set the TV/VTR SWITCH of the monitor to the VTR position. The monitor provides pictures and sound from either 'master' or 'slave' as determined by the push-button selection of the Duplicator.

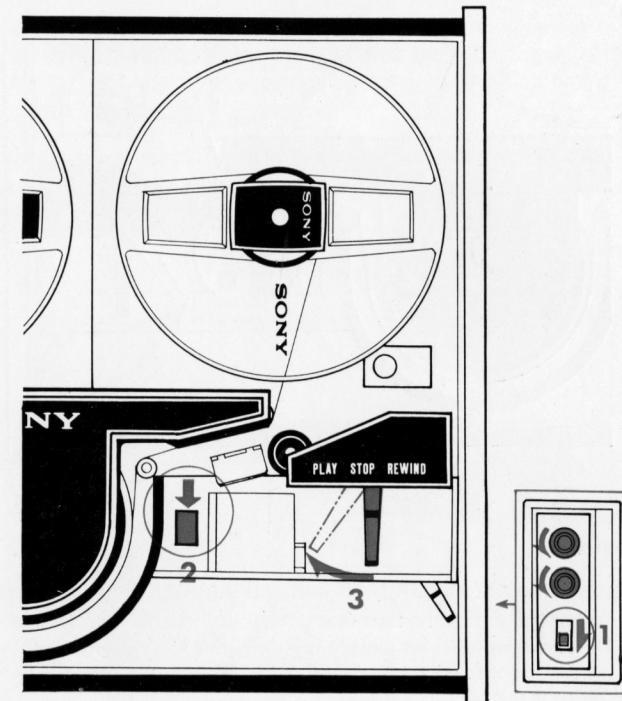
Note: LEVEL METER ON THE SLAVE VIDEOCORDER

During manual recording, when the LEVEL METER SELECTOR is set to the AUDIO position, the meter indicates the audio recording level of the slave Videocorder. When the selector is set to the VIDEO position, the meter indicates video recorded level on the master tape. The video recording level of the slave Videocorder can not be adjusted with the VIDEO LEVEL CONTROL KNOB.

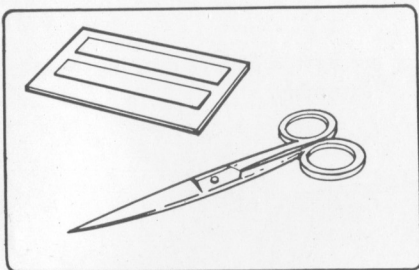
Erasure of prerecorded tape is automatically accomplished when the Videocorder is recording mode, as the tape first passes the erase head, then moves on to the recording heads. Should you desire to erase tape without recording, set the AGC/MANUAL SWITCH to MANUAL position and turn AUDIO and VIDEO levels all the way down, then pressing the RECORD BUTTON, move the FUNCTION SELECTOR to the PLAY position.

Bulk erasing may be accomplished by using a bulk eraser. This results in quick erasure of prerecorded pictures and sound.

Note: It is recommended to use an exclusive bulk eraser for video tapes. With the use of a conventional eraser for audio tapes ($\frac{1}{4}$ " width), the video tapes ($\frac{1}{2}$ " width) may not be erased completely.

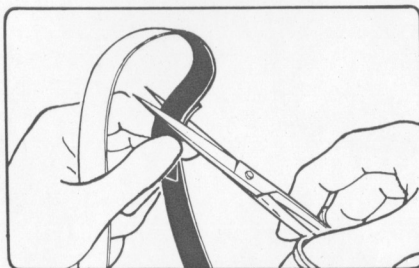


Splicing Tape

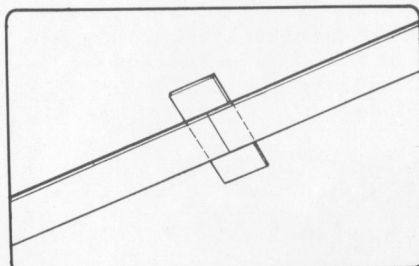


1. Use the Splicing Tape supplied with your Videocorder. (Video Splicing Tape Scotch #390 may be substituted.)

Note: Never use regular audio splicing tape, as damage to Rotary Video Heads will result.



2. Overlap the tape ends approximately $\frac{1}{2}$ inch and make a cut across both tapes at right angles to the length of the tapes.

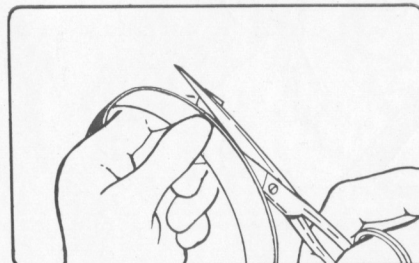


3. Align the ends carefully so that they fit together perfectly.

4. Press a piece of splicing tape firmly over the shiny sides of the ends.

Make sure that the joint is firm.
Note: If any space is left between joints, the Rotary Heads might be damaged.

5. Trim the excess splicing tape slightly into the Video Tape so that edges may be even.



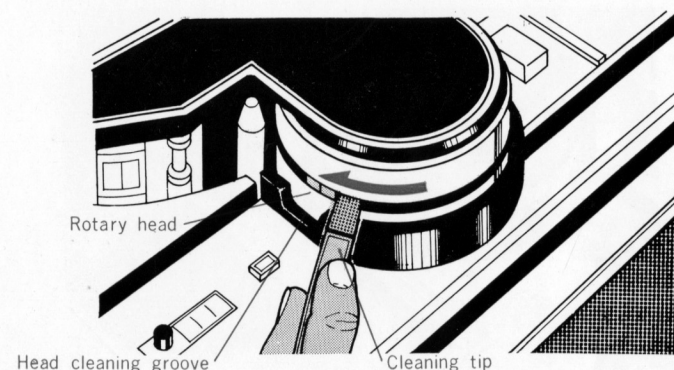
Maintenance

Routain Maintenance

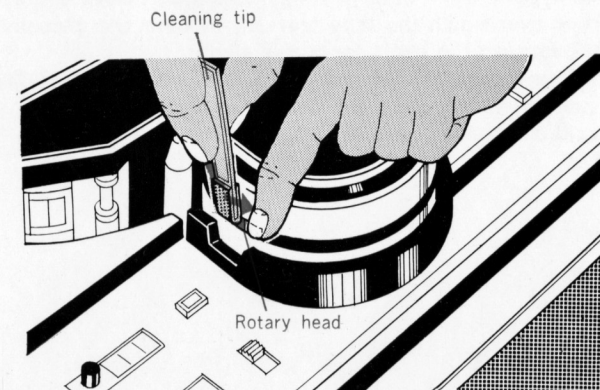
1. Cleaning the Rotary Heads

Before attempting to clean the Rotary Heads, be sure the power is turned off at the Videocorder.

- a. Move the Rotary Head to the cleaning groove at the left side (see illustration) by gently pushing the head around with the tip of the cleaner.

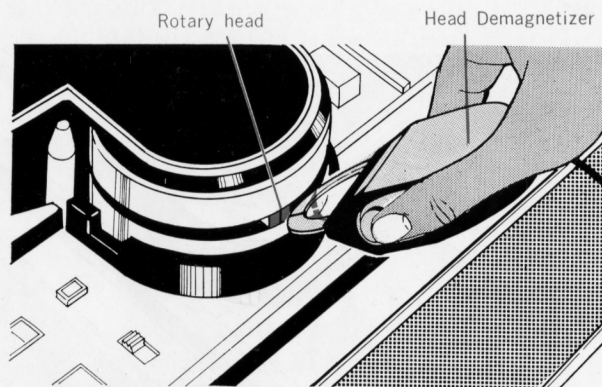


- b. Gently hold the edge of the Rotary Head with your finger tip to keep the head from moving. Press the tip of the cleaner lightly against the head and clean by moving the tip horizontally. Never move the tip vertically.



2. Demagnetizing the Heads

Through constant use the heads may become slightly magnetized; this could cause a distorted picture. In extreme cases it could cause a partial erasing of the tape. Heads may be demagnetized by using standard studio head demagnetizers. Be sure that the head demagnetizer never touches the Rotary Heads.



Cleaning the Slip Rings

Intermittent black and white lines running across the picture may be caused by dirty slip rings in the rotary head drum assembly.



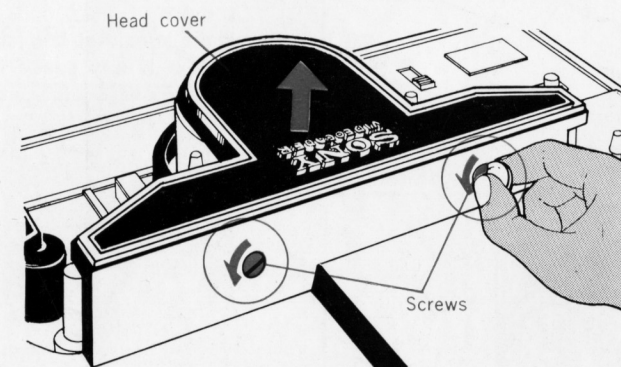
The VIDEO LEVEL CONTROL/STANDBY KNOB must be pushed in.

- a. Loosen the two screws on the back of the head cover (see below) with a coin or screwdriver counterclockwise. Gently pull the head cover straight up and remove it from the Videocorder. Remove the tape from the tape path.

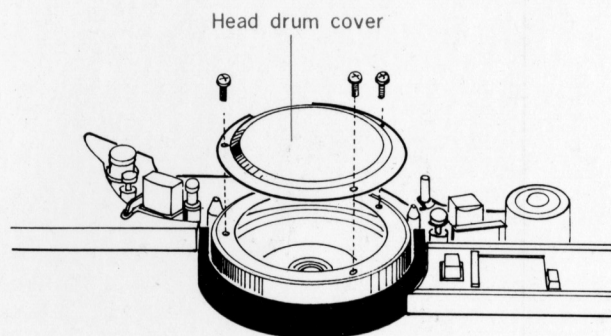
3. Cleaning Tape Path

To keep an intimate contact between heads and tape, it is advisable to clean tape path from time to time; take a soft cloth and carefully wipe the portion over which the tape travels. In case the deposits cannot be removed, dampen the cloth denatured alcohol.

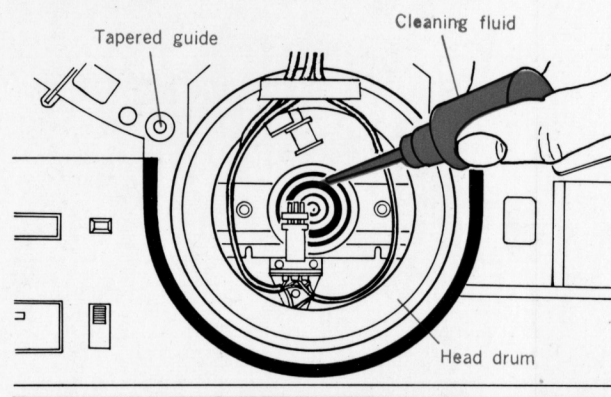
Wipe the surface of the head drum with the supplied cleaning fluid, before and after operating the set on or near the sea or in the location where acid or alkali gas are used.



- b. Open the head drum cover by releasing the three screws on the cover.



- c. Take the cleaning fluid (supplied) and squeeze 3 or 4 drops onto the slip ring. Pull the VIDEO LEVEL CONTROL/STANDBY KNOB to start the Rotary Heads turning. After a few seconds, push in the VIDEO LEVEL CONTROL/STANDBY KNOB. Wipe the outer edge of the head drum and the tapered guides located at both side of the rotary head assembly with the polishing cloth (supplied). Replace the head drum cover and the head cover. Tighten the screws gently until they are firm.

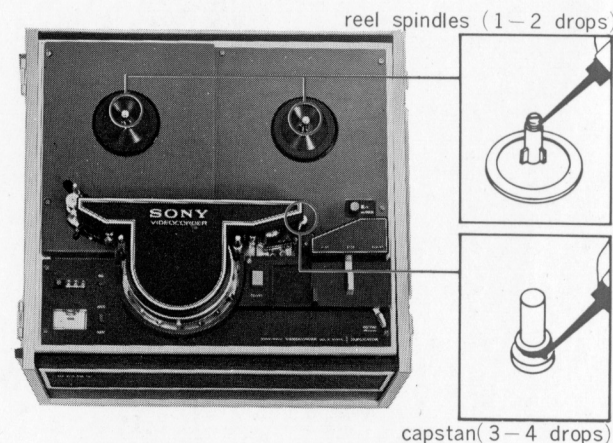


Cleaning the Cabinet

If the cabinet or panel becomes dirty, clean it with the polishing cloth (supplied). Never use solvents, thinner or acetone for cleaning; damage to the cabinet or panel will result.

Lubrication

After approximately 300 hours of use the capstan and the reel spindles should be lubricated. Oil should be applied sparingly. Use 3 or 4 drops on the capstan and 1 or 2 drops on the reel spindle (see photo). Use SONY Oil OL-1K (supplied). Make sure all excess oil is wiped off completely. Avoid excess lubrication, which can cause damage to the mechanism or contamination of the tape.



Technical Specifications

GENERAL

- Power requirements:** 115-120 V, 60±0.4Hz ac
Power consumption: 60 watts
Ambient temperature: 32° F-105° F
Video recording system: Rotary two-heads slant-track scanning 2:1 interlaced composite video signal based on American TV standards Magnetic servo control
Transistors, diodes, etc.: 63 transistors, 36 diodes, 1 FET

VIDEO SIGNAL

- Inputs:** 1.4 Vp-p, 75 ohms (unbalanced)
Output: 1.4 Vp-p, 75 ohms (unbalanced)
Resolution: Approximately 220 lines
Signal-to-noise ratio: Greater than 40 dB

AUDIO SIGNAL

- Inputs:** Microphone input -65dB, 600 ohms, unbalanced
Auxiliary input -20 dB, high-impedance unbalanced
Output: Line output 0 dB, high-impedance, unbalanced
Frequency response: 80-10,000 Hz
Signal-to-noise ratio: Greater than 40 dB

TAPE TRANSPORT

- Tape speed:** 7½ ips
Tape Width: ½ inch
Recording time: 60 minutes, continuously, using V-32 tape (2370 ft)
30 minutes, continuously, using V-31 tape (1240 ft)

Rewind time & fast

- forward time:** Within 7 minutes

DIMENSION AND WEIGHT

- Dimensions:** 18½" (W) × 11" (H) × 15¾" (D)
Weight: 49 lb

ACCESSORIES

- Supplied:** Tape V-30, Reel RH-7V, Head-and-Ring cleaner set, SONY Oil OL-1K lubricating oil, Polishing cloth, Splicing tape, TV (8-pin) connector, AC (3-pin) power cord, 2-pin plug, 12-pin dummy plug (plugged in the DUPLICATE CONNECTOR)

- US Patent number:** US Pat. 3,175,034 3,359,365

Hz (hertz): Cycles per second

Design and specifications subject to change without notice.